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Notice of Allowability

Application No.

09/832,410

Examiner

Ted M. Wang

Applicant(s)

SCHMIDL ET AL.

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 03/29/2007 amendment.
2. ☒ The allowed claim(s) is/are 2-12.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 06/05/2007.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Arguments

1. Applicants' amendments and arguments, filed on 03/29/2007, with respect to Claims 2-4 and 6-8 have been fully considered and persuasive. The 35U.S.C.112 second paragraph has been withdrawn.

Examiner Amendments

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. Authorization for this examiner's amendment was given in a telephone interview with Applicant's representative Carlton Hoel on June 5, 2007.

4. The application has been amended as follows:

In the claims:

- Claim 5, line 5, after "(K" insert --- is ---.

Allowable Subject Matter

5. Claims 2-12 are allowed.

6. The following is an examiner's statement of reasons for allowance.

- The prior art fails to teach an apparatus of Claims 2, 5 and 9 that specifically comprises the following:

-- The instant application is deemed to be directed to a non-obvious improvement over the admitted prior art of the instant application and the invention patented in Pat. No. US 5,999,800, US 6,067,324 and US 5,471,647. The improvement comprises -

With regard claim 2, "wherein said communication channel has - MN- P coefficients, α_{ij} for $i = 1, \dots, M$ and $j = 1 \dots N$ where M and N are positive integers and P equals the product of M multiplied by N, and α_{ij} relates to transmission from the i th antenna of a transmitter to the j th antenna of a receiver, and said matrix is CC^H where C is the $M \times N$ matrix with i th row and j th column entry α_{ij} and H is Hermitian conjugate." as recited in combination with other limitation as claimed,

With regard claim 5, "transmitting on said communication channel baseband signals $x_1 \dots x_K$ (K is a positive integer) with the relative weightings of each of said signals among said antennas corresponding to components of a linear combination of said eigenvectors of said matrix; wherein said linear combinations of said signals maximize the minimum distance between received different signals at a receiver." as recited in combination with other limitation as claimed, and

With regard claim 9, "a channel analyzer coupled to said antennas and operable to estimate eigenvalues and eigenvectors of an $M \times M$ matrix derived from coefficients of a communication channel from said antennas to a receiver; a signal generator coupled to said antennas and to

said channel analyzer and operable to apply signals S1, ..., SM to said antennas A1, ..., AM, respectively; wherein said signals are proportional to the components of a linear combination of said estimated eigenvectors."
as recited in combination with other limitation as claimed.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is (571) 272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

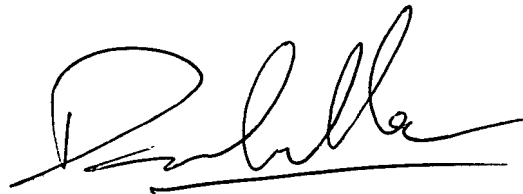
Ted M Wang

Examiner

Art Unit 2611

Ted M. Wang

TW

A handwritten signature in black ink, appearing to read 'Ted M. Wang', with a horizontal line underneath.

**DACHA
PRIMARY EXAMINER**